



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,406	03/27/2006	Koichi Watanabe	017447-0194	2973

22428 7590 06/22/2010
FOLEY AND LARDNER LLP
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER

BERMAN, JASON

ART UNIT	PAPER NUMBER
----------	--------------

1795

MAIL DATE	DELIVERY MODE
-----------	---------------

06/22/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/573,406	Applicant(s) WATANABE ET AL.	
	Examiner Jason M. Berman	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-14 is/are pending in the application.
- 4a) Of the above claim(s) 4-9, 12 and 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) 1, 3, 10-11 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of the Claims

Claims 1 and 3-14 are pending in the current application.

Claims 4-9 and 12-13 are withdrawn as being directed to a non-elected invention.

Response to Amendment

Applicant's amendment of 3/15/10 does not render the application allowable.

Status of the Rejections

All rejections from the previous office action are withdrawn.

New grounds of rejection under 35 USC 103(a) are necessitated by the amendments.

1. Claim 1, 3, 10-11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ceasar (US 4,416,755) in view of Kanzaki (US 6,197,134) and Mitsui.

As to claim 1, Ceasar discloses a sputtering target which consists essentially of silicon (col 8 lines 31-34: pure silicon sputtering target) which is polycrystalline in nature (col 8 lines 31-34).

Ceasar, while disclosing the target is polycrystalline, is silent as to the crystal orientation ratios and a sintered structure with a relative density between 70 and 95%.

Art Unit: 1795

Kanzaki discloses a method of forming fcc metal targets (col 1 lines 8-10) in which the process forms a ratio of 220 to 111 is less than 1.0 (abstract; col 2). This ratio, along with other properties, is disclosed as providing desired orientations which posses all characteristics required for effective sputtering materials (col 1 lines 61-64).

Mitsui discloses a Silicon target for formation of a SiO₂ film at high speed (col 4 lines 50-52, abstract) in which the relative density of the target is greater than 60%, or 80% (claim 12, col 5 line 48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the target with a crystal orientation ratio of Kazanki, with a silicon target of Ceasar (Silicon is inherently a FCC metalloid) because this allows for formation of an effective sputtering target (Kazanki at col 1 lines 61-64). Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the target with a relative density of 80%, as disclosed by Mitsui with the target of Ceasar in view of Kazanki, because this creates an effective target for forming SiO₂ films (Mitsui at col 4 lines 50-52, abstract).

As to claim 3, Neither Ceasar nor Kanzaki explicitly disclose the Vicker's hardness of their respective sputtering targets. However, Vicker's hardness is an intrinsic property of a material. It would therefore be inherent that a silicon target, as that of Ceasar in view of Kanzaki, would have the same hardness as any other target formed of the same materials by the same process and would therefore have a Vicker's hardness within the claimed range.

As to claims 10 and 11, Ceasar discloses the sputtering of the silicon target with oxygen (col 7 line 9) which would form a silicon dioxide film.

It should also be noted that the manner of operating a device does not differentiate an apparatus claim from the prior art. A recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structure limitations of the claim. MPEP 2114. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997).

As to claim 14, Mitsui discloses the target has a sintered structure (paragraph 24: sintering of Si containing target).

Response to Arguments

2. Applicant argues in the remarks that Kanzaki is not applicable to the instant invention and claims because Kanzaki is directed towards copper materials and not silicon. While the examples of Kanzaki include copper and aluminum (col 10 table 2), Kanzaki is directed towards the formation of FCC material sputtering targets in which beneficial properties are obtained by control of the I_{220} and I_{111} crystal intensity faces are controlled (col 1 lines 61 to col 2 line 20). Although the examples of Kanzaki are copper and aluminum, one of ordinary skill would recognize that the benefits of Kanzaki would be applied to the FCC metalloid material silicon. Ceasar, as discussed above, discloses the use of a polycrystalline silicon target, but is silent as to the orientations of the crystal faces within the target. Therefore, one of ordinary skill in the art would look

Art Unit: 1795

towards Kanzaki, disclosing the beneficial results of controlling crystal face orientations within FCC material targets.

3. Applicant argues within the remarks that Mitsui is not applicable to the instant invention and claims because Mitsui is directed towards the formation of a SiC target and not a target consisting essentially of Si. As discussed above, Mitsui is relied upon for its disclosure of the knowledge in the art of sintering Si containing targets. Mitsui is not relied upon for its disclosure of a specific target composition. Ceasar is silent as to the formation method of the Silicon target, and Kanzaki discloses a heat treatment step during the formation of its target (col 6 lines 48-60: heat treatment of FCC targets), but is silent as to the relative density of the target. It would therefore be obvious to one of ordinary skill in the art to perform a sintering step, as disclosed by Mitsui, with the pure Silicon target of Ceasar, because this would allow for the formation of a cohesive target with reduced impurities (Mitsui at paragraph 31).

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

Art Unit: 1795

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Berman whose telephone number is (571)270-5265. The examiner can normally be reached on M-R 8am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571)272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/

Supervisory Patent Examiner, Art Unit 1753

Application/Control Number: 10/573,406

Page 7

Art Unit: 1795

/J. M. B./

Examiner, Art Unit 1795

6/22/2010